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Thursday 21 July 2016

Lecture Theatre, Main Building, TU Berlin

4.30 Opening of the meeting, L (O)
From Hopf Algebras to Machine Learning via Rough Paths

Rough path theory aims to build an effective calculus that can model the interactions between complex oscillatory (rough) evolving systems. At its mathematical foundations, it is a combination of analysis blended with algebra that goes back to LC Young, and to KT Chen. Key to the theory is the essential need to incorporate additional non-commutative structure into areas of mathematics we thought were stable. At its high points, there are the regularity structures of Martin Hairer that allow robust meaning to be given to numerous core nonlinear stochastic pdes describing evolving interfaces in physics.

Classic results, by Clark, Cameron and Dickinson, demonstrate that a nonlinear approach to the data is essential. Rough path theory lives up to this challenge and can be viewed as providing fundamentally more efficient ways of approximately describing complex data; approaches that, after penetrating the basic ideas, are computationally tractable and lead to new scalable ways to regress, classify, and learn functional relationships from data. One non-mathematical application that is already striking is the use of signatures on a daily basis in the online recognition of Chinese Handwriting on mobile phones.

6.00 Reception (Ticket required)

LMS members will have the opportunity to sign the Membership Book which dates back to 1865.

For a ticket to the reception, please email Elizabeth Fisher (lmsmeetings@lms.ac.uk)

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